

OBSTETRICS

Risk factors for retained placenta

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OBJECTIVE: Retained placenta complicates 2–3% of vaginal deliveries and is a known cause of postpartum hemorrhage. Treatment includes manual or operative placental extraction, potentially increasing risks of hemorrhage, infections, and prolonged hospital stays. We sought to evaluate risk factors for retained placenta, defined as more than 30 minutes between the delivery of the fetus and placenta, in a large US obstetrical cohort.

STUDY DESIGN: We included singleton, vaginal deliveries ≥ 24 weeks ($n = 91,291$) from the Consortium of Safe Labor from 12 US institutions (2002–2008). Multivariable logistic regression analyses estimated the adjusted odds ratios (OR) and 95% confidence intervals (CI) for potential risk factors for retained placenta stratified by parity, adjusting for relevant confounding factors. Characteristics such as stillbirth, maternal age, race, and admission body mass index were examined.

RESULTS: Retained placenta complicated 1047 vaginal deliveries (1.12%). Regardless of parity, significant predictors of retained

placenta included stillbirth (nulliparous adjusted OR, 5.67; 95% CI, 3.10–10.37; multiparous adjusted OR, 4.56; 95% CI, 2.08–9.94), maternal age ≥ 30 years, delivery at 24 0/7 to 27 6/7 compared with 34 weeks or later and delivery in a teaching hospital. In nulliparous women, additional risk factors were identified: longer first- or second-stage labor duration, whereas non-Hispanic black compared with non-Hispanic white race was found to be protective. Body mass index was not associated with an increased risk.

CONCLUSION: Multiple risk factors for retained placenta were identified, particularly the strong association with stillbirth. It is plausible that there could be something intrinsic about stillbirth that causes a retained placenta, or perhaps there are shared pathways of certain etiologies of stillbirth and a risk of retained placenta.

Key words: postpartum hemorrhage, preterm birth, retained placenta, stillbirth

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Postpartum hemorrhage is the primary cause of maternal mortality in developing countries and reported by the World Health Organization to be responsible for 25% of all maternal fatalities.¹ Postpartum hemorrhage complicates approximately 2–3% of vaginal deliveries.² Although uterine atony is the most common etiology of postpartum hemorrhage, other etiologies include

cervical or vaginal lacerations, coagulopathies, and a retained placenta.

Although there is no universal consensus for the length of time allotted for the placenta to deliver before it is diagnosed as retained, intrapartum guidelines from the National Institute for Health and Clinical Excellence in London and the World Health Organization suggest using 30 minutes

following delivery of the neonate as the length of time after which some type of intervention is advised, especially in the presence of bleeding.^{3,4} Treatment may involve manual or operative extraction of the placenta, potentially increasing the risks of hemorrhage, postpartum infections, and prolonged hospital stays.^{5,6}

Several reports since the early 1990s have identified risk factors for

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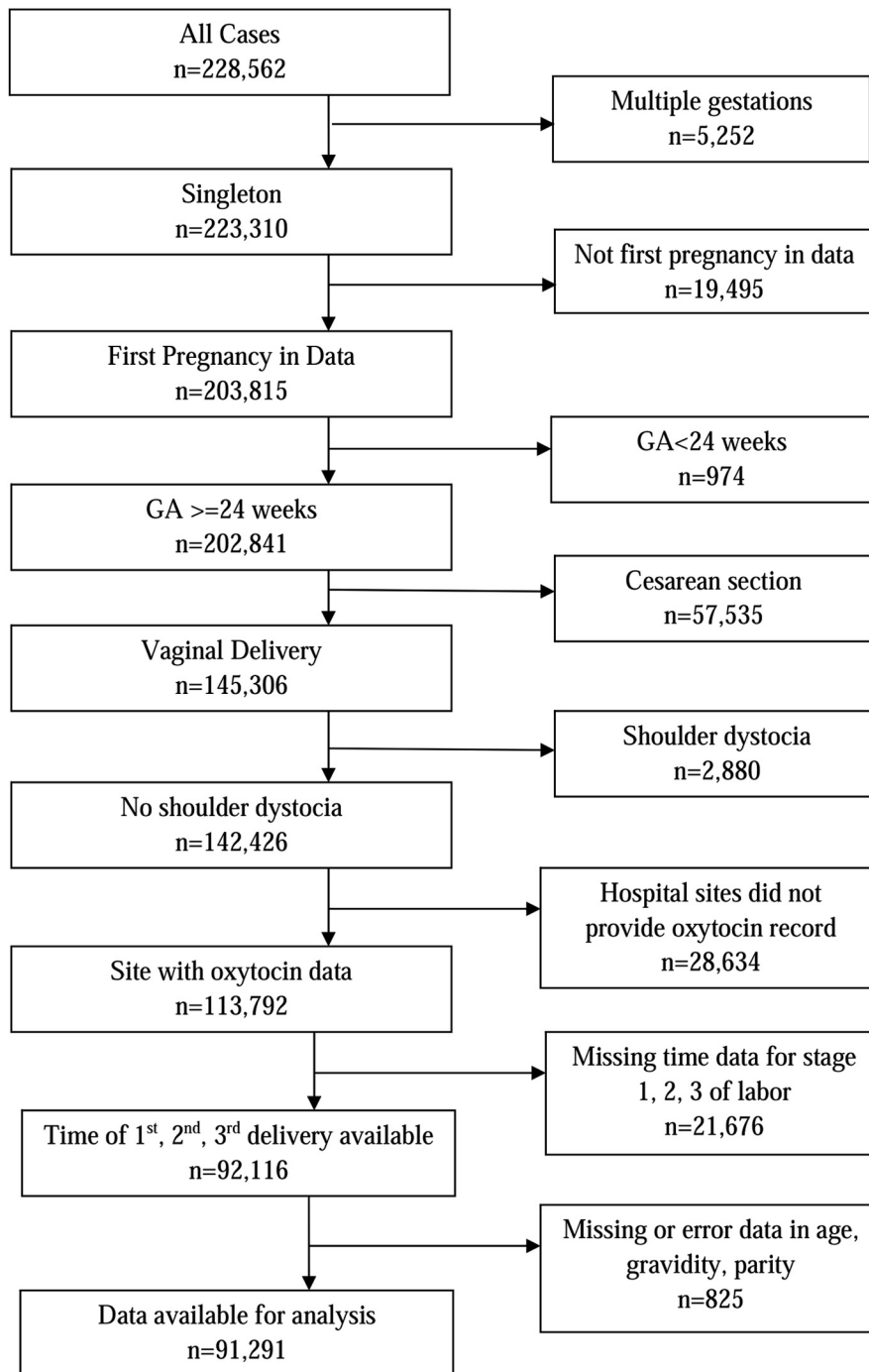
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FIGURE 1
Case selection diagram



GA, gestational age.

Coviello. Risk factors for retained placenta. *Am J Obstet Gynecol* 2015.

studies have examined the US population.

It also remains unknown whether there are differences in retained placenta among maternal races or an association with increasing body mass index (BMI), both factors that may differ from non-US populations. The goal of this study was to identify underlying factors for retained placenta, specifically focusing on potential racial differences and increasing maternal BMI by using the Consortium on Safe Labor database.

MATERIALS AND METHODS

We performed a secondary analysis of deidentified data collected from the Consortium on Safe Labor database, a retrospective cohort study of 228,562 deliveries from 12 US clinical centers between 2002 and 2008.¹² Data were collected from obstetric, labor progression, and newborn electronic medical records linked to hospital discharge codes. This original study received institutional review board approval from all participating institutions, and the current analysis was deemed exempt by the MedStar Washington Hospital Center's Institutional Review Board on Oct. 17, 2013.

For the present analysis, we included women with singleton gestations, delivery gestational age ≥ 24 weeks, and vaginal deliveries. Only the patient's first documented pregnancy in the Consortium on Safe Labor database was used for analysis. Cases with shoulder dystocia or hospitals without adequate documentation of pertinent variables were excluded (Figure 1). The total number of deliveries available for analysis was 91,291.

The third stage of labor was calculated from the time of neonate delivery to the time of placental delivery as recorded in the electronic medical record. Retained placenta was defined as longer than 30 minutes.^{3,4} Bivariate analyses were performed to assess the relationship between a retained placenta and maternal demographic or clinical characteristics with a χ^2 test, Fisher exact test, Student *t* test, or Wilcoxon rank sum test, if applicable. Multivariable logistic regression analyses estimated the adjusted

retained placenta to be induction of labor, high parity (one study citing parity of ≥ 5), history of retained placenta, previous dilatation and curettage, preterm delivery, and small

placental weight.⁷⁻¹¹ The study by Endler et al⁹ in 2014 was the first to suggest an association between term stillbirth and retained placenta in a Swedish population. However, no

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